Chapter Eleven – SANDAG Transit Study

11.0 INTRODUCTION

This report evaluates the potential for developing a transit operating plan for the University Avenue corridor that would enhance service to residents and employees of North Park and take advantage of the transit infrastructure (transit lanes, potential signal priority, and stop consolidation) proposed by the University Avenue Mobility Plan. This report evaluates transit demand and recommends route restructuring to better meet the demand, as well as physical improvements to speed transit travel along the route.

11.1 EXISTING SERVICE

University Avenue currently is served by two of Metropolitan Transit System's most productive transit services, Route 7 and Route 908. Route 7 runs along University Avenue from the City of La Mesa to downtown San Diego. Route 908 runs on University Avenue from Fairmount Avenue westward, and then terminates at the Old Town Transit Center. In addition, Route 70 serves University Avenue from La Mesa to Interstate 15 (east of the study area), connecting to downtown San Diego via I-15 and State Route 94 during peak periods. Each day, buses provide 325 trips along University Avenue (counting both directions), providing service for 16,000 passenger trips (with roughly 50 passenger trips per bus trip). Despite high ridership, changes in travel demand along the corridor, including changes in major destinations and trip lengths, warrant a fresh look at the transit service needed to better meet the needs of local residents, employees, and visitors. These changes in demand may partially explain a general decline in ridership on Routes 7 and 908, despite a general increase in density along that corridor over the last five years (Table 11-1).

Table 11-1
Routes 7 and 908 Performance Trends

	Passengers/Revenue Mile				
Route	**FY03**	**FY02**	**FY01**	**FY00**	**FY99**
7	5.72	6.10	6.63	6.97	7.14
908	4.34	4.11	4.44	4.77	4.77
Passengers/Revenue Hour					
Route	**FY03**	**FY02**	**FY01**	**FY00**	**FY99**
7	50.90	52.30	55.70	58.74	60.50
908	37.40	32.20	37.60	40.50	40.60

Notes: Revenue Miles are miles traveled when the vehicle is in revenue service (i.e., the vehicle is available for travel by the general public). Running time and layover/recovery time are included in this measure.
Revenue Hours are hours traveled when the vehicle is in revenue service (i.e., the vehicle is available for travel by the general public). Running time and layover/recovery time are included in this measure.
Source: Historical Short Range Transit Plans for the Metropolitan Transit Development Board (MTDB).

11.2 NEEDS OF CURRENT RIDERS

A 2003 household survey of San Diego residents found that 51 percent of respondents had used transit some time within the past 12 months. However, only nine percent of said users rode transit regularly (at least once per week). In fact, the survey found that nearly 60 percent of past riders stopped using transit as soon as they had access to a car for their trip. The primary reasons for this mode shift are lower speeds and less reliability of the transit trip compared to the car, lack of accessibility to desired destinations, and a sense of lack of safety, comfort, and cleanliness.

A 2001 onboard survey of passengers on Routes 7 and 908 generated comments similar to those noted above. Respondents stated that the greatest needs are for improved travel speed, reliability, and quality of service.

11.3 RIDERSHIP PATTERNS

Two sources of information were used to estimate future demand for transit services - travel forecasting, which estimates travel demand between activity centers based upon projected housing and employment densities, and the onboard surveys described above, which include information about passengers' starting and destination points.

Analysis of residential and employment density along the corridor shows which areas have the most promise for capturing transit ridership. In the Route 7 neighborhoods, the highest population density is within a quarter-mile of University Avenue, between Park Boulevard and 54th Street, and in Hillcrest. In the forecast for 2030, the greatest population increases are expected to occur within the already-dense communities between Park Boulevard and 54th Street (especially in North Park and City Heights), and in the Hillcrest and Uptown areas. The only area with significant employment density along the corridor is Hillcrest, and job density in this area is not expected to increase substantially by 2030.

SANDAG's 2000 base year transportation model was used to estimate travel within, into, and out of the University Avenue corridor. The model analyzed daily trip making between "University West," including Uptown, North Park, Normal Heights, and Kensington-Talmadge; and "University East," including the eastern area, College, La Mesa, and other regional destinations. The University Avenue corridor was split into two subareas because they exhibit different travel patterns and, potentially, a different market for transit services. The model reflects both total travel demand and work travel demand.

Total travel demand into and out of University West is significant, with nearly 1.5 million trips being made each day. About half these trips are regional (beginning or ending outside the area) and half are local. Travel out of University West to other areas in the region is greater than trips into the area (870,000 compared to 600,000 trips, respectively).

Major destinations (over 15,000 trips per day) for travelers from University West are Fashion Valley, Centre City, Southeast San Diego, Midway/Airport, College Area, Mid-City East, Kearny Mesa, Linda Vista, West Navajo, Sorrento/University area, and La Mesa. Travel into University West (over 10,000 trips per day) comes from Southeastern San Diego, Fashion/Mission Valley, College Area, Mid-City East, Centre City, Midway Airport, and Skyline-Paradise Hills.

Total travel demand into and out of University East is significant, with nearly 1.25 million trips being made each day. About half the trips are local and half are regional. The regional travel pattern shows strong activity centers, with 680,000 trips coming into University East, compared to 580,000 going out. Major regional destinations (over 10,000 trips per day) for travelers from University East include East Navajo, Mid-City, Lemon Grove, Santee, Spring Valley, El Cajon, Fashion/Mission Valley, Southeastern San Diego, and Centre City. Major regional origins (over 15,000 trips per day) going to University East include East Navajo, Mid-City, Spring Valley, Lemon Grove, Skyline-Paradise Hills, El Cajon, and Southeastern San Diego.

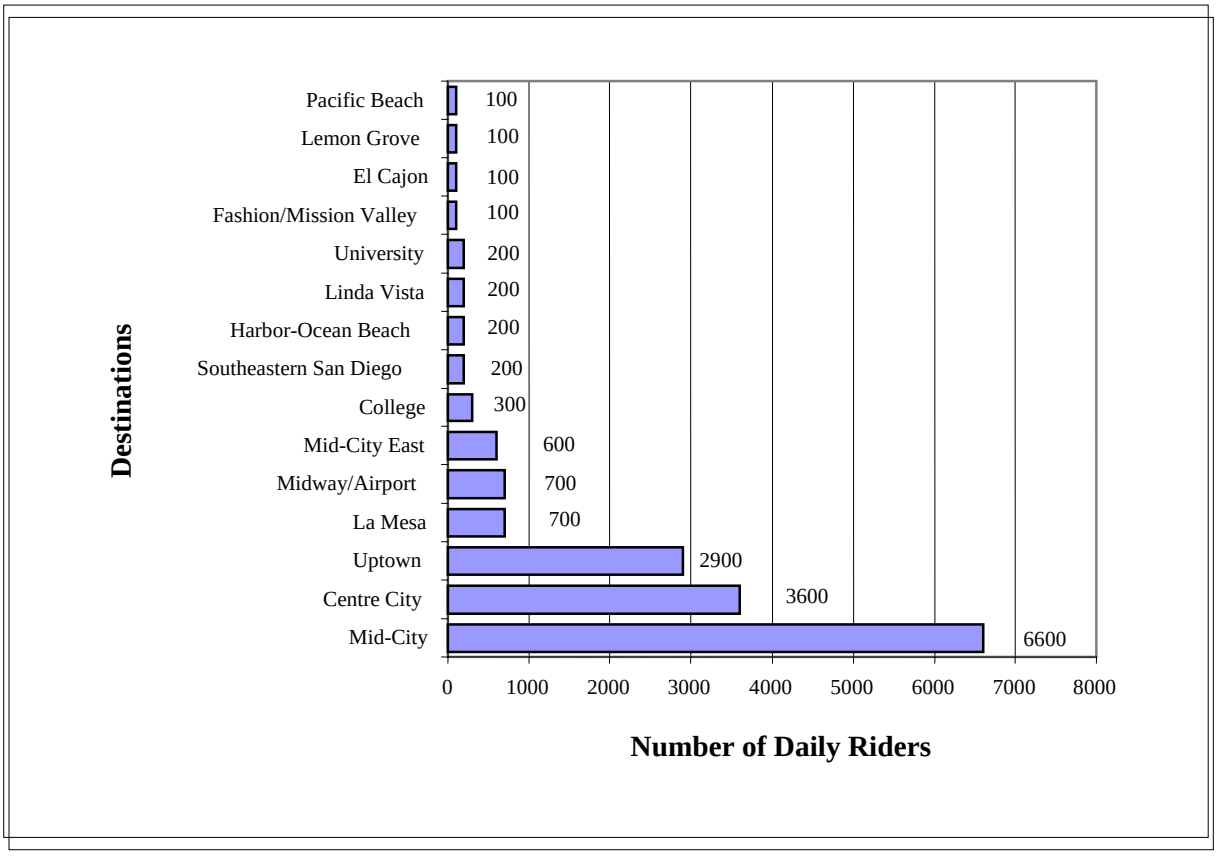
Work travel demand includes the Uptown area and La Mesa as the major attractors of work trips within the Route 7 corridor. Commuter travel out of University West and University East is much more prominent than commuter travel into the area.

Work travel from University West shows the University Towne Centre area as the highest attractor of trips, even though it is a significant distance away. Other major regional employment destinations (over 5,000 trips per day) from University West include Centre City, Fashion/Mission Valley, Kearny Mesa, Midway/Airport, and National City west. Work travel into University West is primarily from Southeastern San Diego and Skyline-Paradise Hills, each with over 2,000 trips per day.

Work travel from University East gravitates more to east county job centers such as La Mesa, Santee, and El Cajon. Other major regional employment destinations (over 3,000 trips per day) coming from University East include Centre City, University, and Kearny Mesa. Work travel into University East originates primarily in East Navajo, Mid-City, Spring Valley, and Skyline-Paradise Hills, each with over 3,000 trips per day.

SANDAG's 2001 onboard transit survey found that 60 percent of trip-ends on Route 7 and Route 908 lie within the University Avenue corridor itself, with the remainder of the trips being regional trips that are longer in nature and depend upon connections (transfers) to other regional services. The most significant destinations for transit riders of Routes 7 and 908 are shown in Figure 11-1.

Figure 11-1
University Avenue Study Routes



11.4 NEED FOR RAPID BUS SERVICE

The travel patterns of people coming from or going to University Avenue include a significant amount of regional travel. In addition, SANDAG's transportation forecasts show that work travel is getting lengthier throughout the region, primarily due to housing being located further away from employment. Surveys of existing riders show a great interest in faster travel linking the Mid-City area with work and other regional destinations. Providing a Rapid Bus service alternative to existing local service would greatly enhance transit service for existing riders, and hopefully attract new riders. Rapid Bus service is an express service that stops at fewer stations and provides a faster trip. It complements local routes which serve more stations, increasing accessibility at the cost of lower speeds.

The highest levels of transit activity are in the communities of City Heights (between Marlborough and 54th Street), North Park (between Park and I-805), and Hillcrest (west of Park). Ridership on Route 7 shows a dramatic drop east of College Avenue into La Mesa. Land use densities along the corridor show the areas with the greatest potential for attracting new riders. The first priority for Rapid Bus service

should be to improve the travel speed along the University Avenue corridor for service into downtown San Diego and La Mesa. Additional improvements are warranted to facilitate regional travel by enhancing service to key transfer locations to facilitate efficient network connections. These major regional destinations include the job centers of UTC/Sorrento Valley and Kearny Mesa. This report details a service strategy for Rapid Bus service along the University Avenue corridor with connections to La Mesa and downtown.

11.5 RAPID SERVICE CONCEPT

In reviewing Route 7 ridership by segment, it can be seen that only four percent of the ridership travels east of 69th Street, and only 21 percent of the ridership travels east of Fairmount Avenue. These numbers support the concept of higher service frequencies in the western portions of the corridor, especially North Park. Downtown-destined passengers (i.e., south of University Avenue) amount to 35-40 percent of total ridership. The high demand for the current route configuration and expected future growth in the corridor warrant continuation of the current basic route structure, with its focus principally on connecting North Park with Centre City via Park Boulevard (Route 7) and Old Town via Uptown (Route 908).

Opportunities to significantly improve the operating speed of the service (through delay reduction strategies) and to enhance the pedestrian experience should be aggressively pursued, as detailed by the University Avenue Mobility Plan. These actions would: (a) improve the neighborhood transit orientation, (b) increase transit service attractiveness to customers (faster and more predictable), and (c) reduce transit costs or allow more service to be operated for the same cost. This strategy will also further leverage the planned Bus Rapid Transit (BRT) lane investment along Park Boulevard (the "Showcase Project"). A phased approach would allow for future capital improvements (upgraded shelters and stations) to be made to achieve a service with all the components of BRT. BRT service along University Avenue is included in the Revenue Unconstrained scenario of the Regional Transportation Plan.
Two alternative operating strategies that include Rapid Bus service for the University Avenue corridor are as follows:

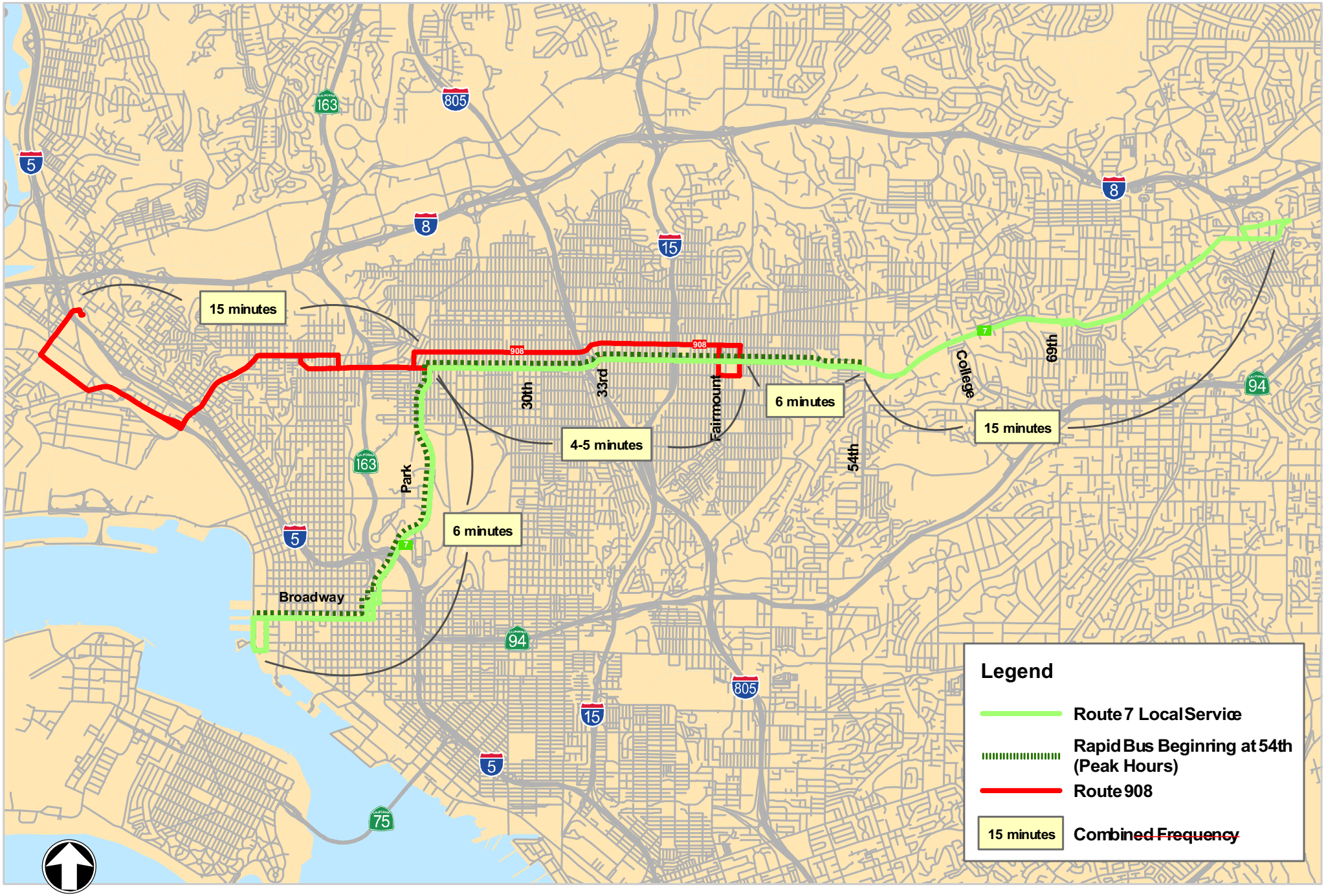
Option 1 (Figure 11-2)

- Route 7 operates as a local service from La Mesa to downtown (30-minute frequency) with additional frequency in the segment from 69th Street to downtown (additional 30-minute frequency, for a combined 15-minute frequency on this segment);
- A Rapid Bus service runs from 54th Street to downtown (10-minute frequency) during peak periods;
- Route 908 remains unchanged (15-minute frequency) from Fairmount to Old Town; and
- Express Route 70 is deleted in favor of the new Rapid Bus service.

Option 2 (Figure 11-3)

- A modified Route 7 operates as a local service from La Mesa to 54th Street (15-minute frequency), and continues as a Rapid Bus service from 54th Street to downtown;
- Additional Rapid Bus service operates between 54th Street and downtown during peak periods (additional 7 1/2-minute frequency, for a combined 5-minute frequency on this segment);
- Route 908 service operates locally within the corridor (15-minute frequency) and is extended east to terminate at 54th Street rather than Fairmount Avenue; and
- Express Route 70 is deleted in favor of the modified Route 7.

Both options include the consolidation of stops throughout the corridor, traffic signal improvements, and the introduction of a Rapid Bus service that focuses on the high ridership and important transfer stops between 54th Street and downtown. The Rapid Bus service will improve operating speeds and reduce delay for those passengers using the major stops and traveling to downtown. Experience elsewhere has found that offering limited stops will concentrate ridership and provide further efficiency benefits for passengers and transit operations. Transit-only lanes are proposed for the segment of University Avenue from Utah to Boundary Street eastbound and from Florida Street to Boundary Street westbound. The eastbound transit-only lane could be extended westward to Park Boulevard in the future, pending analysis of operating conditions in the corridor. A transit-only lane also is proposed along Park Boulevard through Balboa Park as part of the Transit First Showcase Project.

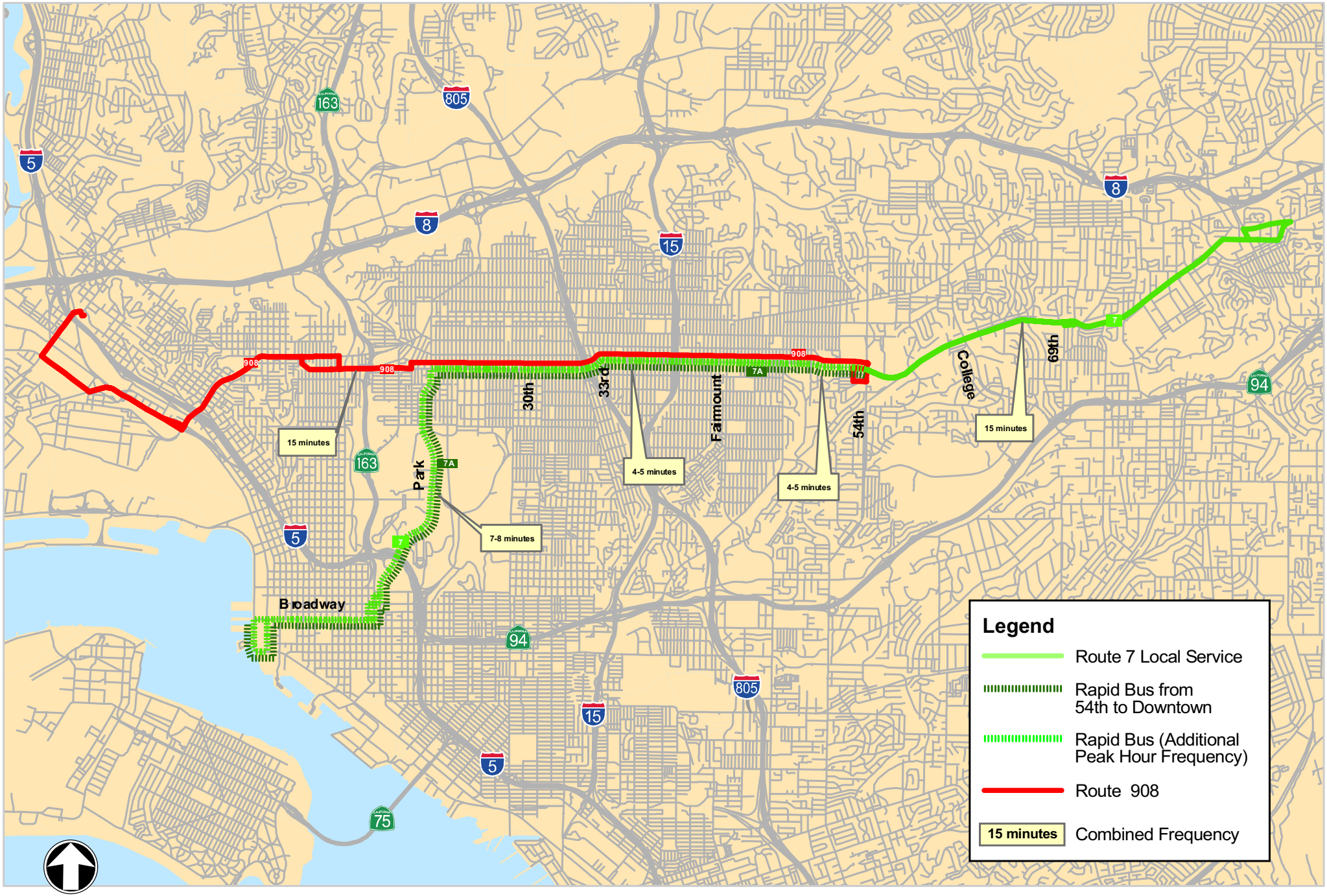


Not to Scale

PROPOSED OPTION 1 ROUTES IN UNIVERSITY AVENUE STUDY AREA

55-100140.001 - November 2004

EXHIBIT 11-2



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PROPOSED OPTION 2 ROUTES IN UNIVERSITY AVENUE STUDY AREA

55-100140.001 - Novemeber 2004

EXHIBIT 11-3

Based upon a review of the effects on travel time of service improvement strategies observed in other Rapid Bus systems, these strategies are expected to have the following improvement to running times:

Table 11-2
Percent Improvement to Transit Running Times

Service Improvement Strategy	Estimated Impact	
	Peak	Off Peak
Stop Consolidation	8%	5%
Limited Stops	7%	5%
Signal Priority	10%	10%
Transit-Only Lanes	5-10%	5%
TOTAL	30-35%	25%

The service frequency would vary depending on the option selected. However, for both options, the improved running time frees up resources (including vehicles and drivers) that can be used for additional service frequency in the corridor or for other regional routes serving Mid-City. Table 11-3 shows potential headways between vehicles for the two options, assuming that the newly-freed resources would be applied to other regional routes serving Mid-City, rather than additional frequency on the University Avenue corridor.

Table 11-4 quantifies the number of vehicles/drivers needed to implement the two options, compared to the current route structure. Again, the vehicles/drivers freed up by the improved route efficiencies could be applied to additional service in the University Avenue corridor or to other services benefiting Mid-City.

Table 11-3
Service Frequency

University Corridor – Service Frequency						
Route	**A.M. (min.)**	**Midday (min.)**	**P.M. (min.)**	**Evening (min.)**	**Saturday (min.)**	**Sunday (min.)**
Existing						
La Mesa	24	24	20	20/3	24	24
Downtown	5	12	6-7	15	12	12
Corridor	4-5	6-7	4-5	7-8	8-9	8-9
Option 1						
La Mesa	15	24	15	15/30	15	15
Downtown	10	12	6	15	15	15
Corridor	4-5	6	4-5	10	10	10
Option 2						
La Mesa	15	20	15	15/30	24	24
Downtown	7-8	10	7-8	15	12	12
Corridor	4-5	6	5	10	8-9	8-9

Notes: The service headways shown represent the following:
La Mesa – service provided between downtown and La Mesa,
Downtown – combined service for all University corridor branches operating to/from downtown (i.e., Routes 7, 7A, 7B, 70, Options 1 and 2), and Corridor – maximum service provided by all services operated on any segment in the North Park portion of the University corridor, including Routes 7 and 908.

Table 11-4
Number of Vehicles Required

University Corridor – Vehicles Required						
Option	**A.M.**	**Midday**	**P.M.**	**Evening**	**Saturday**	**Sunday**
Existing	27	21	30	13/10	16	16
Option 1	25	19	27	9/6	14	14
Option 2	22	11	23	9/6	13	13

Table 11-5 estimates the average speeds that would be achieved by implementing the strategies employed by this report (stop consolidation, signal priority, transit-only lanes).

Table 11-5
Average Transit Vehicle Speeds

UNIVERSITY CORRIDOR – ESTIMATED AVERAGE SPEEDS							
Option	**Direction**	**AM (mph)**	**Midday (mph)**	**PM (mph)**	**Evening (mph)**	**Saturday (mph)**	**Sunday (mph)**
Existing	Inbound	10.6	9.0	9.0	13.4	9.7	9.7
	Outbound	11.8	9.6	9.6	13.5	10.7	10.7
With Strategies	Inbound	15.0	12.8	12.6	17.7	12.8	12.8
	Outbound	13.5	11.4	11.2	16.7	11.4	11.4

11.6 STOP CONSOLIDATION

Bus stops along the University Avenue corridor should be consolidated to better balance stop access with delay to create a faster transit trip. With the current Route 7 configuration, there are 79 stops outbound and 75 stops inbound. The number of stops should be reduced to 43 in each direction. These Route 7 stops also would be used by Route 908 on the overlapping portions of its route. Bus stop consolidations for Route 908 west of Park Boulevard also should occur, but are not analyzed here.

Within the North Park study area, bus stops would occur at the following locations:

- Alabama Street,
- Texas/Arizona Street,
- Oregon/Pershing,
- 30th Street, and
- Iowa/32nd Street.

Additional stops would occur just outside the study area, just east of I-805 and on Park Boulevard south of University Avenue.

Despite the 44 percent reduction in the number of bus stops, the majority of current riders will be within a short walking distance of the consolidated stops. Virtually all stops that are proposed for elimination are well within 1/4 mile walking distance of the remaining stops. It is expected that the additional time that some passengers incur by walking a greater distance to board the bus will be more than offset by the reduced travel time once on the bus (which will benefit all riders). With the consolidation, 235 of the current 26,921 boarding and alighting passengers would be subject to a walk exceeding 1/4 mile. This is equivalent to less than one percent of the boarding and alighting passengers.

Both service options include a Rapid Bus service connecting North Park to downtown. Within the study area, the Rapid Bus service would serve stations at 30th Street and Texas/Arizona.

11.7 CONCLUSIONS

The implementation of a variety of transit priority strategies in the University Avenue corridor will result in better transit service to North Park and other transit passengers, and a more efficient use of resources that will further improve the system. By implementing the strategies of stop consolidation, transit-only lanes, and Rapid Bus operation, as well as possible traffic signal priority, service to transit passengers can be improved significantly using the same level of investment as the current route structure. Additional operating funds that may be identified in the future would allow for further expansion of frequency or better service to other major regional destinations.

Each of the improvement strategies would improve running times throughout the corridor. The ability of the individual strategies to result in a savings in resources relates directly to service frequencies. The greater the savings in time and resources, the greater the attractiveness to current and potential customers. It will be more difficult to realize a savings if only one or two of the strategies are implemented. However, any savings could result in service improvements.

The difference between the two options relates to the degree of use of local versus Rapid Bus service. Option 1 provides a comparable level of local service along the length of the route to the existing level. The limited service from 54th Street to downtown provides a Rapid Bus service during peak periods only. To provide good local service, it is proposed that the timing of service from La Mesa be coordinated with the Route 908 service to provide a combined 7-8 minute service along University west of 54th Street. A ten minute Rapid Bus service would be overlaid at 54th Street to downtown.

For Option 2, more Rapid Bus service is provided, but local service is reduced. Local passengers would have a 15 minute service frequency while passengers using the major stops would have a 4-5 minute (peak) and 10 minute (mid-day) service frequency in the University Avenue corridor and enjoy significantly faster travel.

The option selected for implementation should be subject to a greater level of analysis to determine overall passenger impact. With the expected growth in the University Avenue corridor, it is imperative that an attractive service be provided for all users. The addition of connections to other major destinations in the area should be the subject of a comprehensive analysis to determine how best to use the resources provided by these service improvements.